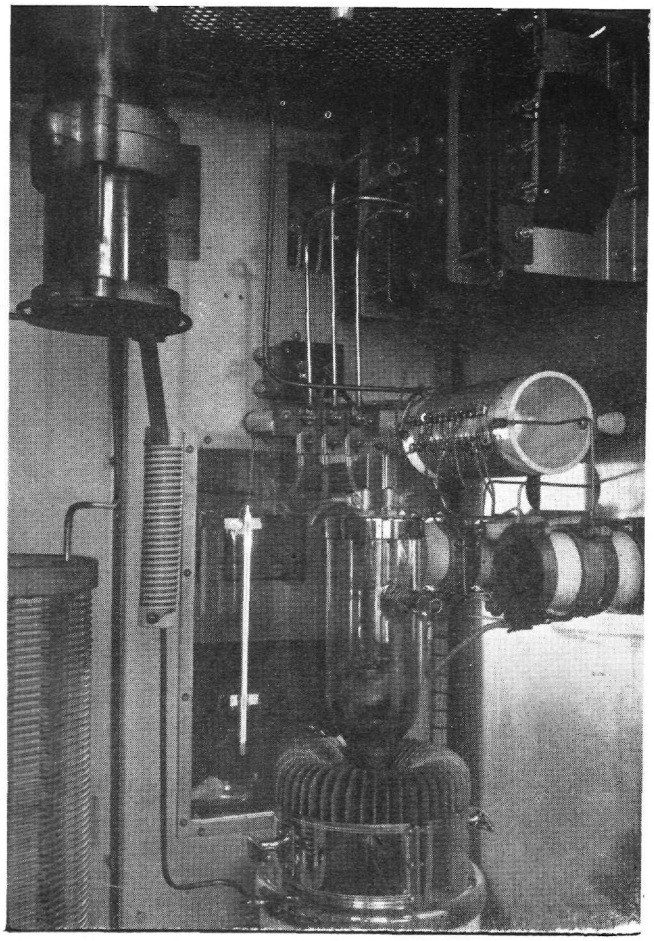
820 ON YOUR DIAL

By HENRY WEISZ, E.E. IV

FROM about 1908 to 1919, electrical communication from the Ohio State University consisted principally of telegraph messages containing vital information such as weather reports. Wireless transmission from the campus began officially June 3, 1922, with experimental broadcasting of regular programs under the call letters WEAO by the department of electrical engineering. A modulated-oscillator type transmitter was used at a power of 500 watts. The antenna was suspended from the smokestack atop Robinson Laboratory.

In 1925, a new station was built under the supervision of Robert C. Higgy, the present director



Power amplifier inside transmitter

of the station and assistant professor of electrical engineering. The transmitter was housed in a small wooden structure just northwest of the Communications Laboratory in the north end of which were erected, during the summer of 1928, two studios, a control room, and offices to accommodate the station. Two 140-foot towers were erected in 1925 on either side of the transmitter room.

A new transmitter, which was a 1000-watt, Western Electric, grid-modulated type with a Class B linear amplifier, was installed in the spring of 1932. During May, of the previous year, a complete new speech input unit was installed, providing for a better quality of transmission.

In September, 1933, the call letters of the station were changed to WOSU, the ones in use at the present time.

Two consoles were added to the equipment of the control rooms in 1938. Each is an RCA, Type 80-B, two-channel affair which permits control of program transmission and local studio activities such as auditions, at the same time. Four microphones per studio are each separately controlled by the consoles each of which is provided with telephone lines for "remotes" as well

Professor Higgy at controls of the console

as two transcription turn-tables. The frequency response of each is flat from 20 to 12,000 cycles with ± 1 decibel between peaks of the response curve. Each console contains approximately twenty tubes.

The transmitter was moved from the campus to the University golf course, a distance of approximately four miles, in April, 1938. Here, during the same year, a 330-foot antenna was constructed at a cost of $7500.

The transmitter in use at present was installed in August, 1941, at a cost of approximately $28,000. At the same time, the station's power was increased to 5000 watts.

(Continued on page 22)

820 ON YOUR DIAL

(Continued from page 12)

The transmitter is an RCA 5-DX high-level type which is air-cooled. It employs a 250-watt output exciter unit which drives an output Class C amplifier which is modulated with a Class B audio amplifier using inverse feedback. The plate suppy is a three-phase full-wave rectifier unit with a delta-to-zigzag transformer connection and with a direct-current output of 8,500 volts.

An elaborate, automatic control system is an important part of the transmitter. The main relays and breakers are centralized on a special control panel. Full automatic control (push one button to start, push another to stop) and manual control (step-by-step) are provided. Overload relays, blower interlocks, and time delays insure against damage to equipment.

Technical data of special interest to the radio engineer are as follows:

Carrier Power—5000 watts.

Carrier Frequency Range—550-1,600 kc.

Carrier Frequency Stability—Usually within ± 1 cycle.

Modulation Capability—100%.

Audio Distortion—Less than 3% r.m.s., 0.95% modulation, 50-7500 cycles.

Audio Frequency Response—Uniform within $\pm 1\frac{1}{2}$ db, 30-10,000 cycles.

Carrier and Hum Level—Better than 60 db below 100% modulation, unweighted.

Power Input—5 KW Input—no signal—14.1 KW no modulation. 5 KW Input—average signal—15.0 KW 10% modulation. 5 KW Input—100% sine wave 23.0 KW. Power factor approximately 90%, 230 volts, 3-phase, 60 cycles.

Antenna and Line—For use with concentric or grounded 4-wire transmission lines of 70-300 ohms characteristic impedance and with standard antennas.

Audio Input Level—Zero level (12.5 m.w.) at 500 ohms for 100% modulation.

Telephone lines carry the programs from the studio to the transmitter, thus making for better fidelity. The frequency response is flat up to 12000 cycles. This is rather unusual inasmuch as the response of most broadcast transmission lines fall off at about 8000 cycles. This is a quality equivalent to frequency-modulation transmission. The noise level is 60 db. below program level and the harmonic distortion is of the order of 1% throughout the audio range.

The coverage of WOSU is one of the best in Ohio. The field strength of the station is, as a conservative figure, 0.5 millivolt per meter at a

(Continued on page 28)

820 ON YOUR DIAL

(Continued from page 22)

distance of 100 miles; this is considered to be good by the Federal Communications Commission.

The technical operation of the station is under the supervision of Charles H. Boehnker, chief engineer, with a staff consisting of two transmitter engineers and four studio engineers.

Tentative plans have been made for the construction of new studios in a planned addition to the north wing of the Journalism building which is just west of the present location. An increase to a power of 10,000 watts is possible with only a few changes being necessary.